

Appl. No. 10/647,613
Amdt. dated August 18, 2006
Reply to Final Office Action of June 21, 2006

REMARKS

Applicant has carefully reviewed the Office Action mailed June 21, 2006, prior to preparing this response. Currently claims 1-32 are pending in the application, wherein claims 1, 2, 5, 7, 9-11, 14, 16, 18, 19, 21, 22, 25, 26, 28, 29 and 32 have been rejected and the remainder of the claims have been withdrawn from consideration consequent an Examiner-induced requirement for restriction. Favorable consideration of the following remarks is respectfully requested.

Claims 1, 2, 5, 7, 9-11, 14, 16, 18, 19, 21, 22, 25, 26, 28, 29 and 32 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Samson et al., U.S. Patent No. 5,827,201, in view of Dobson, U.S. Patent No. 5,724,989. Applicant respectfully traverses the rejection, asserting a *prima facie* case of obviousness has not been established with the cited combination.

Claim 1 recites:

1. A medical device comprising:
a coil having a longitudinal axis and a radial axis orthogonal to the longitudinal axis, formed from a wire, the wire comprising:
 - (a) a cross-section with a centroid;
 - (b) a moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil; and
 - (c) a moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil, wherein the moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil.

Claim 10, which is directed to a medical guidewire, includes similar limitations of a wire forming a coil.

In the Office Action, the Examiner erroneously states that a composite coil of two different materials wherein the outer material has a larger Young's modulus than that of the inner material "dictates that the moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil." Applicant respectfully disagrees with this statement.

The mere observation that an outer material of a member has a larger Young's modulus than that of an inner material does not, in and of itself, dictate the relationship of the moments of

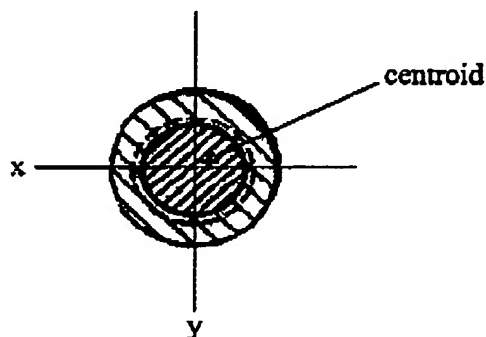
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inertia of the member. Indeed, the multi-layer spring 14 taught in Dobson fails to exhibit the claim limitations that the wire forming the coil has a moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil which is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil.

Applicant notes the moment of inertia as described in the current application, which is otherwise known as the second moment of area, is a property of a shape which may be used to determine the resistance to bending and deflection of the shape. In general, a shape is more efficient to resist bending when the greater part of its mass is as far as possible from its centroid. This is evidenced by the equations provided at page 13, line 7 of the current application.

The ratio of the moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis to the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of a member would be 1:1 in a member having a bi-axially symmetrical cross-section. This is also evidenced by the equations provided at line 7 of page 13 of the current application. In order to change the ratio, more material would need to be moved away from the x-axis (longitudinal axis) without moving the same or greater amount of material away from the y-axis (radial axis), or vice versa.

The cross-section of the spring 14 disclosed in Dobson is reproduced below with the inclusion of a longitudinal axis (axis x) running through the centroid and a radial axis (axis y) running through the centroid.



The dimensional characteristics and material distribution of the cross-section of the spring 14 illustrated in Figure 3 of Dobson, which is bi-axially symmetrical (e.g., symmetrical about the x and y axes), would result in a 1:1 ratio. Namely, as the cross-section of both the

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inner material 32 and the outer material 30 is circular in nature, an equal amount of material would be located at all radial locations from the center of the cross-section (which also would be the centroid in this case). Using the equations which are provided at line 7 of page 13 of the specification, one of skill in the art would conclude that the moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis would be equal to the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the spring 14. Thus, Dobson does not exhibit the claim limitations that the wire forming the coil has a moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil which is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil.

It follows that the Examiner's assertion that a composite coil of two different materials wherein the outer material has a larger Young's modulus than that of the inner material "dictates that the moment of inertia with respect to an axis running through the centroid and parallel to the longitudinal axis of the coil is greater than the moment of inertia with respect to an axis running through the centroid and parallel to the radial axis of the coil" (emphasis added) is clearly not a true statement in all instances, including the instance disclosed in Dobson.

For at least the reasons stated above, claims 1 and 10, as well as claims 2, 5, 7, 9, 11, 14, 16 and 18 which depend from one of claims 1 and 10, are believed patentable over the cited combination. Withdrawal of the rejection is respectfully requested.

Regarding the rejection of claims 19 and 26, the Examiner states that the Young's modulus of tungsten carbide ranges between 450-650 GPa and the Young's modulus of Nitinol ranges between 28-75 GPa. Applicant respectfully asserts these values are irrelevant to the spring 14 taught in Dobson. Dobson teaches a spring 14 formed of a stainless steel core material and a layer of gold deposited on the stainless steel core. See Dobson, Abstract.

For at least the reasons stated above, withdrawal of the rejection of claims 19 and 26, as well as claims 21, 22, 25, 28, 29 and 32 which depend from one of claims 19 and 26, is respectfully requested.

Regarding the rejection of claims 2, 9, 11, 18, 21, 22, 28 and 29, the Examiner states with reference to lines 54-58 of column 9 that "Samson et al discloses a wire of polygonal and rectangular cross section." Final Office Action, June 21, 2006, page 3. Applicant respectfully

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disagrees with the Examiner's suggestion that this passage teaches that which is claimed in claims 2, 9, 11, 18, 21, 22, 28 and 29.

Claims 2, 9, 11, 18, 21, 22, 28 and 29 each further define the cross-section of the wire forming the coil as claimed. In the rejection, the Examiner equated the coil 148, 188 taught in Samson with the claimed coil. However, the cited passage of Samson is not describing either the coil 148 or the coil 188. Instead, the cited passage of Samson is directed to metallic ribbons forming the braid, an entirely different component of the device taught in Samson. Indeed, the cited passage is included in the portion of Samson subtitled "Braids". See Samson, column 8, line 61. Samson expressly describes that the braids are constructed of ribbons. See Samson, column 9, line 30 through column 10, line 19. It is these ribbons, which form the braid, that are described in detail at lines 54-58 of column 9. In carefully reviewing the teachings of Samson, Samson, as well as Dobson, only discloses the use of a coil having a circular cross-section.

For at least this reason, Applicant asserts the identified passage of Samson fails to meet the limitations recited in claims 2, 9, 11, 18, 21, 22, 28 and 29. Furthermore, Dobson fails to remedy the shortcomings of Samson. Thus, the cited combination fails to teach at least these limitations of the claims. Withdrawal of the rejection is respectfully requested.

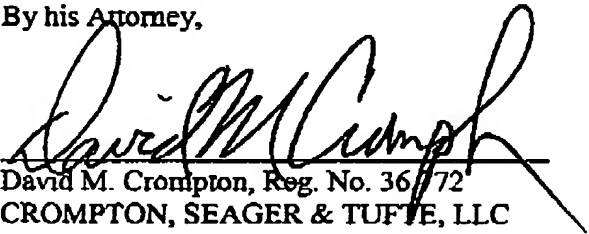
Reexamination and reconsideration are respectfully requested. It is respectfully submitted that all pending claims are now in condition for allowance. Issuance of a Notice of Allowance in due course is requested. If a telephone conference might be of assistance, please contact the undersigned attorney at (612) 677-9050.

Respectfully submitted,

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By his Attorney,

Date: 8/18/06


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